Math 142
Spring, 2006 Name:

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1. Compute the following limits:

   (a) $\lim_{h\to 0} \dfrac{\frac{1}{x+h} - \frac{1}{x}}{h}$

   (b) $\lim_{h\to 0} \dfrac{\sqrt{h^2+4h+5} - \sqrt{5}}{h}$

   (c) $\lim_{x\to 2} \dfrac{|\, x-2\,|}{x-2}$

   (d) $\lim_{x\to 3} \sqrt{\dfrac{x+2}{x+1}}$

   (e) $\lim_{x\to 0} \sqrt{x}\sin\left(\dfrac{1}{x}\right)$

   (f) $\lim_{x\to\infty} \dfrac{x^7-1}{x^6+1}$

   (g) $\lim_{x\to\infty} \dfrac{x-1}{\sqrt{x^2+29}}$

   (h) $\lim_{x\to\infty} \dfrac{3x^{29}+7}{3x^{29}+5}$

2. Which of the above functions (in (a) thru (e)) are continuous at the points where you evaluated the limits?